

**IN THE CLAIMS:**

- 1     1. – 46. (Cancelled)
- 2     47. (Currently Amended) A monitoring device for monitoring a single household electric
- 3     user presenting an electric load, the monitoring device being and including:
- 4         A. a detector, connected between a source of electric energy for the household
- 5               electric user and the electric load of the single household electric user,
- 6               determining at various times the quantity of electric power or current absorbed
- 7               by the single household electric user,
- 8         B. a memory for retaining pre-stored reference data or profiles of electric power
- 9               or current that are absorbed during operating cycles of a corresponding type of
- 10              electric user;
- 11         C. a processor for determining status information that is representative of the
- 12               present status or phase of operation of the single household electric user based
- 13               on the quantities of electric power or current determined by the detector and
- 14               the stored pre-stored reference values; and
- 15         D. communication means for providing the status information to an external
- device.
- 1     48. (Currently Amended) The device, according to claim 47, wherein,
- 2         i.       the processor further determines efficiency information being representative
- 3               of the efficiency or performance status of the single household electric user
- 4               based on the quantity of electric power or current determined by the detector

5                   and the stored reference values, and  
6       ii.       the communication means provides the efficiency information to an external  
7                   device.

1   49. (Currently Amended) The device, according to claim 47, wherein,  
2       i.       the processor further determines wear information relating to estimating the  
3                   wear status of components of the single household electric user, and  
4       ii.       the communication means provides the wear information to an external  
5                   device.

1   50. (Previously Presented) The device, according to claim 47, wherein the reference data  
2   or profiles contained in the memory are representative of a theoretical level of absorption  
3   of electric power or current that the household electric user would absorb if operating  
4   correctly under normal conditions.

1   51. (Previously Presented) The device, according to claim 50, wherein the processor  
2   compares the quantities determined by the detector with the reference data or profiles to  
3   determine the status information.

1   52. (Previously Presented) The device, according to claim 47, wherein the processor  
2   provides the status information to the memory.

1 53. (Currently Amended)The device, according to claim 52, wherein the processor  
2 further:

- 3 a. determines efficiency information indicating the quality of operation of  
4 the single household electric user and/or the efficiency status of its internal  
5 components, the efficiency information relating to deviations which are  
6 considered significant between the quantities determined by the detector  
7 and the stored reference data or profiles,
- 8 b. determines wear information relating to the wear status of components of  
9 the single household electric user and/or the modes of previous use of the  
10 single household electric user, and
- 11 c. retains the efficiency and wear information in the memory.

1 54. (Previously Presented) The device, according to claim 47, wherein the  
2 communication means includes a connection to a communication bus, the communication  
3 means making the status information available to the bus and receiving instructions from  
4 the bus.

1 55. (Previously Presented) The device, according to claim 47, wherein the  
2 communication means is a connection to an external electronic apparatus the  
3 communication means providing the external electronic apparatus access to the status  
4 information and access to the programming of the device.

1 56. (Previously Presented) The device, according to claim 53, wherein the  
2 communication means is a connection to an external electronic apparatus, the  
3 communication means providing the external electronic apparatus access to the status,  
4 efficiency and wear information and access to the programming of the device.

1 57. (Currently Amended) The device, according to claim 47, further including a switch  
2 that operates under the control of the processor for interrupting the electric supply to the  
3 single household electric user.

1 58. (Currently Amended) The device, according to claim 54 further including a switch  
2 that operates under the control of the processor for interrupting the electric supply to the  
3 single household electric user, the processor controlling the switch based on instructions  
4 received over the bus.

1 59. (Currently Presented) The device, according to claim 47, further including  
2 configuration means for selecting, among a plurality of possible selections, the type of  
3 electric user that corresponds to the single household electric user.

1 60. (Previously Amended) The device, according to claim 59, wherein  
2 a. the memory contains a plurality of reference data or profiles relating to the

- 3 operations of various types of electric user, and
- 4 b. the configuration means selects the reference data or profile relating to the
- 5 particular household electric user that is associated with the device.

1 61. (Previously Presented) The device, according to claim 57, further including manual

2 controls for the switch.

1 62. (Currently Amended) The device, according to claim 47, further including

2 a. a current differential sensor for detecting current leaks to ground,

3 b. the processor using the sensor readings to analyse the operations of the

4 single household electric user.

1 63. (Currently Amended) The device, according to claim 47, further including

2 a. a temperature sensor for sensing ambient temperature, and

3 b. the processor using the ambient temperature information to analyse the

4 operations of the single household electric user.

1 64. (Previously Presented) The device, according to claim 47, wherein the

2 communication means is an asynchronous serial line.

1 65. (Currently Amended) The device, according to claim 56, further including acoustic

2 and/or optical signalling means under the control of the processor for signalling  
3 anomalous conditions of operation of the single household electric user.

1 66. (Previously Presented) The device, according to claim 58, further including acoustic  
2 and/or optical signalling means under the control of the processor for signalling the status  
3 of the switch.

1 67. (Previously Amended) The device, according to claim 58, wherein the processor  
2 receives information from one or more external sensors, where the one or more external  
3 sensors is a gas sensor, a flood sensor, or a smoke sensor, and the processor controls the  
4 switch to interrupt the electric supply based, in part, on the readings of the external  
5 sensors.

1 68. (Currently Amended) A method for monitoring the status of a single household  
2 electric user, the method including the steps of:

- 3 A. measuring the absorption of electric power or current by the single  
4 household electric user at various times;
- 5 B. analyzing the measured electric power or current absorption based on pre-  
6 stored reference electric power or current absorption data or profiles  
7 relating to operating cycles of an electric user of a corresponding type;
- 8 C. determining status information being indicative of the status or phase of  
9 operation of the single household electric user based on the results of step

- 10                   B; and  
11           D.       storing the status information.

1    69. (Currently Amended) The method of claim 68 further including

- 2           E.       determining efficiency information relating to the efficiency of the single  
3                   household electric user during the operating cycles based on reference data  
4                   or profiles and the measured absorption; and  
5           F.       storing the efficiency information.

1    70. (Currently Amended) The method of claim 68 further including

- 2           E.       determining wear information based on the number and types of operating  
3                   cycles performed by the single household electric user; and  
4           F.       storing the wear information.

1    71. (Currently Amended) The method of claim 70 further including

- 2           G.       determining efficiency information relating to the efficiency of the single  
3                   household electric user during the operating cycles based on reference data  
4                   or profiles and the measured absorption; and  
5           h.       storing the efficiency information.

1    72. (Currently Amended) The method, according to claim 68, wherein the absorption is  
2    measured instant by instant to determine an absorption profile which expresses the  
3    evolution in time of the real level of absorption of electric power or current by the single  
4    household electric user.

1 73. (Currently Amended) The method, according to claim 68, wherein the reference  
2 absorption profile is representative of the evolution in time of a theoretical level of  
3 absorption of electric power or current that the single household electric user would  
4 produce if operating correctly.

1 74. (Previously Presented) The method, according to claim 68 further including a step of  
2 selecting the reference absorption data or profile from among a plurality of reference  
3 absorption data sets or profiles.

1 75. (Previously Presented) The method, according claim 74, wherein the reference  
2 absorption data sets or profiles are obtained through experimental analysis.

1 76. (Currently Amended) The method, according to claim 68, wherein the status  
2 information is of the functional type, concerning the present mode of operation of the  
3 single household electric user.

1 77. (Currently Amended) The method, according to claim 69, wherein the efficiency  
2 information are of the diagnostic type, concerning the quality of operation of the single  
3 household electric user and/or the efficiency status of its internal components, the  
4 efficiency information resulting from the detection of deviations being considered



5 significant between the measured absorption and the applicable reference absorption data  
6 or profile.

1 78. (Currently Amended) The method, according to claim 70, wherein the wear  
2 information are of the statistical type, concerning the wear status of internal components  
3 of the single household electric user and/or its modes of previous use.

1 79. (Previously Presented) The method, according to claim 78, wherein the wear  
2 information are determined based on an analysis of the status information over time.

1 80. (Previously Presented) The method, according to claim 70, further including the step  
2 of providing certain of the status, efficiency and/or wear information to a communication  
3 network to which a plurality of household electric users are connected.

1 81. (Currently Amended) The method, according to claim 80, wherein the information is  
2 used for estimating the functional and/or wear status of internal components of the single  
3 household electric user in aid in the repair and/or maintenance of the household electric  
4 user.

1 82. (Previously Presented) The method, according to claim 80, wherein certain of the

2 information is used for rationing the electric power absorption in the household  
3 environment in which the electric user is installed.

1 83. (Previously Presented) The method, according to claim 82, further including the step  
2 of controlling, from a remote location, the operating status of the household electric user,  
3 for realizing the activation and/or deactivation of the user, based on the information  
4 provided over the communication network.

1 84. (Previously Presented) The method, according to claim 77, further including  
2 activation of acoustic and/or optical signalling means when the household electric user is  
3 malfunctioning.

1 85. (Currently Amended) A system for monitoring and controlling household appliances  
2 that utilize power from the electric mains, the system including:

- 3 A. one or more first household appliances that communicate over a  
4 communication network; and  
5 B. one or more monitoring devices for monitoring and controlling a  
6 corresponding number of second household appliances, ~~a given each~~  
7 monitoring device communicating over the communication network on  
8 behalf of the associated single second household appliance and including:  
9 i. a detector for determining at various times the quantity of electric  
10 power or current absorbed by the associated second household

- 11 appliance,
- 12 ii. a memory for retaining pre-stored reference data or profiles of
- 13 electric power or current absorbed during operating cycles of a
- 14 corresponding type of household appliance;
- 15 iii. a processor for determining status information that is
- 16 representative of the present status or phase of operation of the
- 17 associated second household appliance based on the quantity of
- 18 absorbed electric power or current determined by the detector and
- 19 the stored pre-stored reference data or profiles; and
- 20 iv. a node for communicating on the communication network, the
- 21 node providing the status information over the network.

1 86. (Previously Amended) The system, according to claim 85, wherein

- 2 v. the monitoring device further determines efficiency information representative
- 3 of the efficiency or performance status of the associated second household
- 4 appliance based on the quantity of absorbed electric power or current
- 5 determined by the detector and the stored reference data or profiles, and
- 6 vi. the node provides the efficiency information over the network.

1 87. (Previously Amended) The device, according to claim 85, wherein,

- 2 v. the monitoring device further determines wear information relating to
- 3 estimating the wear status of components of the associated second household
- 4 appliance, and
- 5 vi. the node provides the efficiency information over the network.

1 88. (Previously Presented) The device, according to claim 85, wherein the reference data  
2 or profiles are representative of a theoretical level of absorption of electric power or  
3 current that the associated second household appliance would absorb if operating  
4 correctly under normal operating conditions.

1 89. (Previously Presented) The system of claim 85 further including  
2 v. a meter for measuring electric power or current absorbed by the household,  
3 the meter communicating the measured household absorption values over the  
4 communication network, and  
5 vi. at each of the first household appliances limiting power or current absorption  
6 based on the communicated household absorption values and a predetermined  
7 maximum absorption value, and  
8 vii. at each monitoring device limiting the power or current absorption by the  
9 associated second household apparatus based on the communicated  
10 household absorption values and a predetermined maximum absorption value.

1 90. (Previously Presented) The system of claim 89 wherein the meter communicates the  
2 household absorption value with variable frequency based on how close the measured  
3 household value is to the predetermined maximum value.

1 91. (Previously Presented) The system of claim 85 wherein the communication network  
2 is a powerline carrier network.

1 92. (Previously Presented) The system of claim 85 wherein the monitoring device  
2 controls the activation and deactivation of the associated second household appliance  
3 based on information communicated over the communication network.

1 93. (Previously Presented) The system of claim 92 wherein the monitoring device  
2 controls the second household appliance based on information provided to the network by  
3 an external device.

1 94. (Previously Presented) The system of claim 93 wherein the information is supplied to  
2 the network by a mobile telephone.

1 95. (Previously Presented) The system of claim 93 wherein the information is supplied to  
2 the network from a remote network.

1 96. (Previously Presented) The system of claim 95 wherein the remote network is the  
2 internet.